

were helpful in the South Atlantic and east Gulf States and in the west Gulf area and far Southwest weather conditions were mostly favorable, with mild temperatures and absence of storms permitting free grazing of livestock in the northern plains. West of the Rocky Mountains cold weather, and in some places snow, was rather hard on livestock, but the additional moisture was of benefit to desert ranges. No materially harmful temperatures occurred, though frost was general in California, necessitating some heating of citrus groves.

During the last decade weather conditions were generally favorable for agricultural interests, as there was an absence of stormy weather until near the close of the month, and most of the period was mild and sunny. Conditions favored livestock in the northern Great Plains with much ranging possible and the higher temperatures in the Southwest were likewise favorable. Rainfall was again deficient in the Southern States, especially on the Florida uplands, where it was very dry. There was no material harm from low temperatures, except that the interior of southern Florida had harmful frosts on the 29th. Snowfall was beneficial for winter grains in parts of the interior of the Northwest and in the main winter wheat belt a snow cover that was deposited about the close of the month furnished protection from the cold wave that overspread the interior of the country immediately thereafter. Husking and housing the remaining corn crop made mostly good progress and conditions favored scrapping the outstanding cotton.

Small grains.—The growth of winter wheat and other fall-sown grains was checked by the cold weather during the first decade that prevailed from the Mississippi Valley eastward and but little growth was made in the more western portions of the belt. The main wheat sections were generally bare of snow, but wheat apparently suffered little or no harm from the low temperatures. In the Pacific Northwest warmer weather, with showers, was favorable toward the close of the period and in the more eastern States winter grains continued in favorable condition, except that moisture was needed in parts of the south Atlantic area.

During the second decade winter wheat and other fall-sown grains made some growth under the influence of the abnormally warm weather and abundant moisture in

the central and eastern portions of the belt. Aside from the extreme western districts, the ground over the major wheat-producing areas was practically bare of snow; in the Rocky Mountain States and eastern Great Basin wheat fields were mostly snow-covered, while in Montana there were beneficial amounts over most wheat districts. In the Pacific Northwest conditions were less satisfactory, but the weather favored winter grain crops in the Atlantic States and the South.

The winter wheat belt continued generally bare of snow until about the close of the last decade, but the prevailing temperatures were not materially harmful, although there were complaints of thawing and freezing locally in the Ohio Valley. In the western belt conditions continued favorable and at the close of the period there was rather widespread snow in many central and western districts. Precipitation in the Pacific Northwest was helpful for winter grains, but additional moisture was needed. In the Rocky Mountain States wheat continued mostly satisfactory, but rainfall would have been beneficial in the South; conditions were generally favorable in the middle Atlantic area.

Miscellaneous crops.—Pastures continued in poor condition in central Gulf sections, but the absence of snow cover in most northern parts from the Great Plains eastward was not serious, as no injury to meadows was reported. Livestock were able to range freely in the northern Plains area throughout the month, with a consequent saving of feed, and much range remained open in the Rocky Mountain region. Conditions continued mostly favorable in the Southwest, but heavy feeding was necessary in the Great Basin, due mostly to poor pasturage. Livestock held up well with only few losses and slight shrinkage reported.

Winter truck did well in most sections where grown, except that some frost injury occurred in Florida and adjacent sections during the first and last decades. Conditions were favorable for grinding sugar cane in Louisiana and generally excellent progress was made. There was some local frost damage to citrus in Florida during the first decade and some dropping due to dryness was reported toward the close of the month, but this crop did well generally. Some firing was necessary in citrus groves in California, but no injury occurred and development of the crop was mostly satisfactory.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

NORTH ATLANTIC OCEAN

By F. A. YOUNG

The weather over the North Atlantic during December presented few unusual features, with the possible exception of the very severe norther in the vicinity of Vera Cruz, Mexico, that will be referred to later. The number of days with gales was slightly below normal over the middle and eastern sections of the steamer lanes, and somewhat above west of the fiftieth meridian. Up to time of writing, no winds of hurricane force have been reported, although a few vessels encountered gales of force 11, as shown in table of gales and storms.

Judging from reports received, the number of days with fog was considerably below normal over the entire ocean, with the exception of the eastern part of the Gulf of Mexico, where it was observed on four days.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, 8 a. m. (seventy-fifth meridian), North Atlantic Ocean, December, 1928

Stations	Average pressure	Departure ¹	High-est	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Julianehaab, Greenland	29.53	(0)	30.36	6th	28.66	31st.
Belle Isle, Newfoundland	29.77	+0.07	30.50	5th	28.62	31st.
Halifax, Nova Scotia	30.00	+0.02	30.50	23d	29.12	29th.
Nantucket	30.08	-0.02	30.46	13th	29.32	18th.
Hatteras	30.12	-0.02	30.44	12th	29.72	18th.
Key West	30.10	+0.01	30.22	24th ²	30.00	1st. ³
New Orleans	30.16	+0.04	30.40	9th	29.90	17th.
Cape Gracias, Nicaragua	29.92	-0.06	29.98	27th ²	29.84	23d.
Turks Island	30.10	+0.07	30.16	30th	30.02	9th.
Bermuda	30.20	+0.05	30.46	31st	29.90	28th.
Horta, Azores	30.29	+0.18	30.62	8th	29.88	16th.
Lerwick, Shetland Islands	29.32	+0.10	30.28	15th	29.24	10th.
Valencia, Ireland	29.99	+0.05	30.55	1st	28.94	10th.
London	30.02	+0.03	30.53	18th	29.14	30th.

¹ From normals shown on Hydrographic Office Pilot Chart, based on observations at Greenwich mean noon, or 7 a. m., seventy-fifth meridian time.

² No normal available.

³ And on other dates.

On the 2d Belle Isle was near the center of a disturbance, and gales of force 7 to 10 occurred between the east coast of Newfoundland and the forty-fifth meridian.

From the 3d to 6th moderate weather with comparatively high pressure prevailed over the greater part of the ocean, although on the 4th moderate westerly gales were encountered in a limited area over the western section of the steamer lanes, and on the 6th a number of land stations in the British Isles reported northerly to northwesterly winds of force 7.

On the 7th one moderate disturbance was central near 41° N., 47° W., and another in the North Sea, while southerly winds of force 9, accompanied by high barometric readings, were reported near 50° N., 57° W.

Charts VIII to XI show the conditions from the 8th to 11th, when both the eastern and western sections of the ocean were swept by storms that reached their maximum intensity and extent on the 10th.

From the 12th to 17th, moderate weather was the rule over the greater part of the ocean, although on the 15th a disturbance was central near 43° N., 47° W., with southerly winds of force 9 to 10 between the fiftieth and sixtieth meridians. On the same day a southerly wind of force 10 was reported about 500 miles west of Scotland.

On the 18th a moderate gale prevailed off Hatteras, and on the same day an exceptionally severe "norther" was reported by the land station at Vera Cruz, Mexico, the wind being given as north, 72 miles an hour, barometer 29.94 inches. This must have been of very limited extent, as the station at Tampico reported wind north-northwest, force 1, while no ships' reports have been received denoting any unusual conditions in that vicinity.

On the 20th moderate conditions again prevailed, except for a comparatively slight disturbance central

in the Gulf of Mexico. This moved rapidly northeastward, and on the 21st was central near Sable Island, with moderate southerly gales in the easterly quadrants.

On the 22d westerly gales occurred on the steamer lanes between the fortieth and sixtieth meridians, and on the 23d between the twentieth and fortieth. On the 23d there was also a well developed low off Hatteras that moved eastward, and on the 24th was central near 39° N., 54° W.

On the 25th the steamer lanes east of the twenty-fifth meridian were again swept by moderate to strong westerly gales, the storm area extending nearly to the Azores, while on that date and on the 26th storm reports were also received from vessels in widely scattered sections of the ocean.

On the 27th a low, central near 50° N., 35° W., was accompanied by moderate gales, with rain, hail, and snow over a limited area in the westerly quadrants. This low moved eastward, and on the 28th the center was near 53° N., 27° W., the weather conditions remaining about the same as on the preceding day; by the 29th the center was near the west coast of Ireland, and the storm area extended as far west as the thirtieth meridian.

On the 27th there was also a disturbance about 300 miles northeast of the Bermudas that moved slowly northward, and by the 29th reached the Gulf of St. Lawrence. This low moved but little in the next three days, and during the remainder of the month moderate to strong westerly gales swept the American coast as far south as the thirty-fifth parallel, and on the 31st heavy weather also occurred over the area from the fortieth to fiftieth parallels, and the fortieth to forty-fifth meridians.